

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of: Clifford Brown et al. : Confirmation No.: 3876
Serial No.: 09/722,168 : Art Unit: 2611
Filed: 11/22/2000 : Examiner: Kevin Y. Kim
For: SYSTEM AND METHOD :
FOR AUTOMATIC
DIAGNOSIS OF
IMPAIRMENTS IN A
DIGITAL QUADRATURE
AMPLITUDE
MODULATED SIGNAL

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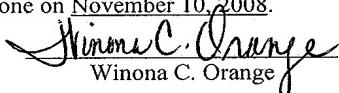
REPLY BRIEF

Sir:

This Reply Brief is filed under the provisions of 37 CFR §41.41 in response to the Examiner's Answer mailed August 13, 2008, and the subsequent Examiner's Answer mailed September 10, 2008, which included the Claims Rejection Preambles. On September 15, 2008, Attorney of Record's paralegal spoke with Examiner Kevin Kim regarding the updated Examiner's Answer. Examiner Kim indicated he would restart the clock, therefore, making the new response deadline November 10, 2008.

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Winona C. Orange

(1) Real party in interest

The real party in interest is as stated in the Appeal Brief.

(2) Related appeals and interferences

The related appeals and interferences is as stated in the Appeal Brief and the Examiner's Answer.

(3) Status of claims

The status of claims is as stated in the Appeal Brief and confirmed in the Examiner's Answer.

(4) Status of amendments

The Examiner's Answer confirmed the claims that stand under final rejection from which rejection this Appeal is taken.

(5) Summary of claimed subject matter

The summary of claimed subject matter is as stated in the Appeal Brief.

(6) Grounds for Rejection to be reviewed on appeal

The statement of the grounds for rejection are as stated in the Appeal Brief and confirmed in the Examiner's Answer.

(7) Arguments

IDENTIFICATION OF, AND REPLY TO NEW POINTS OF ARGUMENT

The following points of argument have been either newly presented in the Examiner's Answer or presented in a different light by the Examiner than earlier in the record.

Issue #1:

Claims 1, 4, 18, and 54 are improperly rejected under 35 U.S.C. §102(b) as being anticipated by Armstrong (U.S. Patent No. 4,381,546, hereinafter "Armstrong").

Claims 1 and 54:

Regarding claims 1 and 54, Appellants respectfully traverse the rejections since the Appellants' claimed combination, as exemplified in claim 1, includes the limitation not disclosed in Armstrong of:

"a phase noise detector comprising;"

The Examiner's Answer states:

"Regarding claims 1 and 54.

Applicant argues, at page 13, that the Armstrong patent fails to teach "a phase noise detector" because the patent teaches phase jitter and shows no [phase noise detector Armstrong 5C] apparatus." [underlining in original; insertion for clarity]

Appellants respectfully submit that Armstrong FIG. 5C merely "depicts" what phase jitter would be expected to look like but that Armstrong does not actually "detect" phase jitter or show a phase noise detector. This is explained in Armstrong col. 4, lines 21-31:

"The line impairments of the rotated eye are depicted in FIGS. 5a-f... For example, frequency offset (with a first order carrier recovery loop) yields a non-zero value for the expected value of the variable on the D axis as shown in FIG. 5a. This may be compared with FIG. 3c wherein the value is zero. Noise is characterized by the same variants (less the mean on both axes) as shown by

a comparison of FIGS. 5b and 3a. Other line impairments may also be readily distinguished as shown." [deletion and underlining for clarity]

The Examiner's Answer states:

Applicant bases this argument on the reading that the calculating means of the patent uses the computational algorithm shown in Figs. 9A-9C. However, Fig.6 of the Armstrong clearly shows the outputs from the calculating means (18), one of which is phase jitter."

Appellants respectfully submit that the bases of the Appellants' argument are incorrect and this is explained above.

With regard to the Examiner's argument that Armstrong's calculating means 18 is the claimed phase noise detector, Appellants respectfully submit that calculating means 18 does not "detect" either phase noise or phase jitter but instead "calculates" phase jitter. The computational algorithm shown in Armstrong FIGs. 9A-9C statistically "calculates" phase jitter from overall noise, as explained in Armstrong col. 4, lines 17-54, which states:

"Once the points are rotated from the X and Y axis to what has been defined as the C and D axis, line impairments may be readily distinguished from one another by means of statistical properties on the C and D axes. ...

A quantitative analysis of the degree of line degradation can be determined by computing the four variables...

The above variables lead to channel impairment information by the following calculations....

Phase Jitter=PJ= constant X $(\Sigma D_l^2 - (\Sigma D^2 / m-N))$ " [deletions and underlining for clarity]

Without being facetious, the claimed invention is analogous to a voting machine determining that Senator Obama wins the Presidency while Armstrong is analogous to a computer determining by a statistical calculation that Senator McCain wins an upset victory.

Based on the above, it is respectfully submitted that claims 1 and 54 are allowable under 35 U.S.C. §102(b) as not being anticipated by Armstrong because:

"Anticipation requires the disclosure in a single prior art reference disclosure of each and every element of the claim under consideration." W.L. Gore & Assocs. v. Garlock, Inc., 721 F.2d 1540, 220 USPQ 303, 313 (Fed. Cir. 1983) (citing Soundscriber Corp. v. United States, 360 F.2d 954, 960, 148 USPQ 298, 301 (Ct. Cl.), *adopted*, 149 USPQ 640 (Ct. Cl. 1966)), *cert. denied*, 469 U.S. 851 (1984). Carella v. Starlight Archery, 804 F.2d 135, 138,

231 USPQ 644, 646 (Fed. Cir.), *modified on reh'g*, 1 USPQ 2d 1209 (Fed. Cir. 1986); RCA Corp. v. Applied Digital Data Sys., Inc., 730 F.2d 1440, 1444, 221 USPQ 385, 388 (Fed. Cir. 1984).

Also regarding claims 1 and 54, Appellants respectfully traverse the rejections since the Appellants' claimed combination, as exemplified in claim 1, includes the limitation not disclosed in Armstrong of:

"[a phase noise detector comprising;]
a sorter;" [insertion for clarity]

The Examiner's Answer states:

"Next, applicant asserts, at page 14, that patent does not teach a sorter because it does not disclose sorting function. When read in light of the specification at page 10, the sorter recited in the claim functions to read data from a storage and arrange them on the constellation. The calculating means of the Armstrong patent performs the same function because it also reads data from the receiver (see Fig.6) and place them on the constellation (see Fig.3A-3C). Since the calculating means performs the same function of placing data on the constellation, it is not unreasonable to read the patent's calculating means as "a sorter" recited in the claim." [underlining for clarity]

Appellants respectfully submit that Armstrong does not place data on a constellation. Armstrong FIGs. 3A-3C merely depict what various line impairments would look like. Armstrong does not disclose a sorter to "sort" and create a constellation because Armstrong makes a quantitative (numerical) evaluation, as will be addressed further below. However, it may be seen that FIGs 3A-3C merely depict a constellation that is not used in the Armstrong quantitative evaluation from the explanation in Armstrong Background col. 1, lines 59-67, which states:

"[S]ince the various distortions manifest themselves in a unique fashion on the eye diagram, it would appear that a qualitative determination of the communications channel could be made by study of the eye diagram. In actual practice, however, the situation becomes complicated by the fact that the degrading influences can be cumulative and thus the clearly defined patterns depicted in FIGS. 3A-3D become distorted by the interaction of the combination of degrading factors. In addition, the eye diagram data does not lend itself to quantitative analysis of the condition of the communications channel primarily because the degrading effect in opposite quadrants tend to cancel each other out. As a result, heretofore, quantitative evaluation of the

communication media has not been possible from the eye diagram.”
[underlining for clarity]

Based on the above, it is respectfully submitted that claims 1 and 54 are allowable under 35 U.S.C. §102(b) as not being anticipated by Armstrong because:

“Anticipation under 35 U.S.C. §102(e) requires that ‘each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference.’” *In re Robertson*, 169 F.3d 743, 745 (Fed. Cir. 1999) (quoting *Verdegaal Bros., Inc. v. Union Oil Co.*, 814 F.2d 628, 631 (Fed. Cir. 1987)).

Also regarding claims 1 and 54, Appellants respectfully traverse the rejections since the Appellants’ claimed combination, as exemplified in claim 1, includes the limitation not disclosed in Armstrong of:

“[a phase noise detector comprising;
a rotator coupled to the sorter;” [insertion for clarity]

The Examiner’s Answer states:

“Applicant argues, at page 15, that the Armstrong patent fails to teach “a rotator coupled to the sorter” allegedly because it the rotator is not coupled to a sorter and the received signal is rotated by a receiver. However, As Fig. 9A clearly shows, after the samples X & Y of the received signal are read or “sorted” they are phase rotated.” [underlining and bold for clarity]

Appellants respectfully disagree because “read” and “sort” are clearly different functions because “read” does not either directly or inherently imply that a “sort” is performed. As explained in Specification page 10, lines3-8, the sorter 800 “sorts”; i.e.:

“The sorter 800 accesses the constellation stored in the constellation storage 706 and sorts its data points into cells. For 64-QAM, the sorter 800 sorts the constellation by laying an 8 x 8 grid over the constellation. The grid is arranged so that the center of each square is the ideal point for each signal level of the QAM signal. The sorter then assigns each datum point to the cell represented by the square in which the datum point lies.” [underlining for clarity]

Thus, there can be no disclosure of the claimed “rotator coupled to the sorter” in Armstrong because no “sort” is performed in Armstrong.

Based on the above, it is respectfully submitted that claims 1 and 54 are allowable under 35 U.S.C. §102(b) as not being anticipated by Armstrong because:

"If the reference fails to teach or suggest even one limitation of the claimed invention, then the claim is not anticipated." *Atlas Powder Co. v. E.I. du Pont De Nemours & Co.*, 750 F.2d 1569, 1574, 224 U.S.P.Q. 409, 411 (Fed. Cir. 1984).

Also regarding claims 1 and 54, Appellants respectfully traverse the rejections since the Appellants' claimed combination, as exemplified in claim 1, includes the limitation not disclosed in Armstrong of:

"[a phase noise detector comprising;
a comparator coupled to the rotator;" [insertion for clarity]

The Examiner's Answer states:

"Applicant also argues, at page 16, that the Armstrong patent fails to teach "a comparator coupled to the rotator" allegedly because the patent performs a statistical analysis on the rotated signal. Armstrong teach [*sic*] comparing the rotated signal points to the ideal signal points. See Fig.3B, for example, where the phase jitter is measured compared to the ideal signal points. Also, Fig.9C shows a comparison step "IS PJR > 35," requiring a comparator."

Appellants respectfully submit that Armstrong FIG. 3B does not teach that "phase jitter is measured compared to the ideal signal points". As explained above FIG. 3B merely depicts or exemplifies what phase jitter looks like in an eye diagram as confirmed in Armstrong Background col. 1, lines 59-67, quoted above.

Armstrong FIG. 9C shows a comparison step "IS PJR > 35" but because PJR is undefined, the comparison step is not inherently connected to the rotation step.

Based on the above, it is respectfully submitted that claims 1 and 54 are allowable under 35 U.S.C. §102(b) as not being anticipated by Armstrong because:

"In relying upon the theory of inherency, the examiner must provide a basis in fact and/or technical reasoning to reasonably support the determination that the allegedly inherent characteristic necessarily flows from the teachings of the applied prior art." *Ex parte Levy*, 17 USPQ2d 1461, 1464 (Bd. Pat. App. & Inter. 1990) (emphasis in original) (The Board reversed the

examiner's rejection because the examiner did not provide objective evidence or cogent technical reasoning to support the conclusion of inherency.).

Also regarding claims 1 and 54, Appellants respectfully traverse the rejections since the Appellants' claimed combination, as exemplified in claim 1, includes the limitation not disclosed in Armstrong of:

"[a phase noise detector comprising;]
a compression detector" [insertion for clarity]

The Examiner's Answer states:

"Applicant argues, at page 17, that the Armstrong patent fails to teach "a compression detector" because it teaches detecting the frequency offset. Since the compression is defined inward movements of signal points in the constellation, it reads on the frequency offset which manifests itself by displacement of signal points away from the ideal signal points, as shown in Fig. 5A." [underlining for clarity]

Appellants respectfully submit that Armstrong FIG. 5A shows a point value but no disclosure of the claimed compression "detector", as disclosed in Armstrong col. 4, lines 23-26, which states:

"For example, frequency offset (with a first order carrier recovery loop) yields a non-zero value for the expected value of the variable on the D axis as shown in FIG. 5a." [underlining for clarity]

Based on the above, it is respectfully submitted that claims 1 and 54 are allowable under 35 U.S.C. §102(b) as not being anticipated by Armstrong because of the holding in *W.L. Gore & Assocs. v. Garlock, Inc., supra*.

Also regarding claims 1 and 54, Appellants respectfully traverse the rejections since the Appellants' claimed combination, as exemplified in claim 1, includes the limitation not disclosed in Armstrong of:

"[a phase noise detector comprising;]
an interference detector;" [insertion for clarity]

The Examiner's Answer states:

"Applicant argues, at page 18, that the Armstrong patent fails to teach "an interference detector" by quoting the specification at page 13, lines 23-25. However, it is well established that the specification is not to be read into the claim. Without more, interference is not distinguished from noise."

Appellants respectfully submit that the Examiner reads "interference detector" on Armstrong FIG. 5B, which shows an example of a noise signal but no disclosure of the claimed interference "detector", as explained in Armstrong col. 4, lines 27-30, which states:

"Noise is characterized by the same variants (less the mean on both axes) as shown by a comparison of FIGS. 5b and 3a." [underlining for clarity]

Based on the above, it is respectfully submitted that claims 1 and 54 are allowable under 35 U.S.C. §102(b) as not being anticipated by Armstrong because of the holding in *W.L. Gore & Assocs. v. Garlock, Inc., supra*.

Also regarding claims 1 and 54, Appellants respectfully traverse the rejections since the Appellants' claimed combination, as exemplified in claim 1, includes the limitation not disclosed in Armstrong of:

"[a phase noise detector comprising;
a constellation storage coupled to the phase noise detector, the compression
detector, and the interference detector." [insertion for clarity]

The Examiner's Answer states:

"Applicant argues, at pages 18-19, that the Armstrong patent fails to teach "a constellation storage." However, as pointed out in the final Office action, in order to rotate signal points and then compare them to the ideal points, a storage for storing the signal points are necessary. Applicant argues that there is no disclosure in Armstrong that a comparison of rotated signal points to the ideal points occurs. Even if appellant's argument was correct, still a storage is needed to rotate and store the signal points, as evidenced at col. 5, lines 27-44."

Appellants respectfully submit that, since Armstrong is relying on mathematical manipulations, direct mathematical rotations may be performed without the need to store

signal points. Thus, Armstrong does not inherently require “a constellation storage” and as explained in MPEP §2112:

“The fact that a certain result or characteristic may occur or be present in the prior art is not sufficient to establish the inherency of that result or characteristic. *In re Rijckaert*, 9 F.3d 1531, 1534, 28 USPQ 2d 1955, 1957 (Fed. Cir. 1993)(reversed rejection because inherency was based on what would result due to optimization of conditions, not what was necessarily present in the prior art).”

Claims 4 and 18.

Regarding claims 4 and 18, Appellants respectfully traverse the rejections since the Appellants’ claimed combination, as exemplified in claim 1, includes the limitation not disclosed in Armstrong of:

“the rotator rotates a vector utilizing the matrix:

$$\begin{vmatrix} \cos\Theta & \sin\Theta \\ -\sin\Theta & \cos\Theta \end{vmatrix}$$

The Examiner’s Answer states:

“These claims recite a vector consisting of cosine and sine functions used by the rotator. Similarly, the Armstrong patent teaches a vector consisting of cosines and sine function in the form of $(1-j1)$, $(-1+j1)$, $(-1+j1)$ and $(1+j1)$. Applicant fails to distinguish how the matrix recited in the claim is different from the matrix of the Armstrong patent.”

Appellants respectfully disagree because Armstrong does not disclose a rotator rotating a vector using a matrix but a receiver rotating a point by an ideal phase angle, as stated in Armstrong col. 4, lines 7-13:

“If a receiver point is determined to be in quadrant 1, its complex value $(X+jY)$ is multiplied by $(1-j1)$ to yield $(X+Y+jY-jX)$. This would reduce to $(2+j0)$ if X and Y both equal 1. Similarly, points in quadrants II, III and IV would be multiplied respectively by $(-1-j1)$, $(-1+j1)$, and $(1+j1)$ to obtain the desired rotation of the present invention. That is, each point is rotated by an ideal phase angle determined by the ideal value of the received point and selected so that the rotated point has its nominally maximum component on the real axis.” [underlining for clarity]

The Examiner has not responded to the above and it is respectfully submitted that based on the above, claims 4 and 18 are allowable under 35 U.S.C. §102(b) as not being anticipated by Armstrong because:

“It is by now well settled that the burden of establishing a *prima facie* case of anticipation resides with the Patent and Trademark Office.” *Ex parte Skinner*, 2 USPQ2d 1788, 1788-89 (B.P.A.I. 1986).

Regarding claims 3-14 and 56-62, these dependent claims respectively depend from independent claim 1 and 54, and stand and fall with the independent claim from which they depend.

Issue #2:

Claims 14, 62, and 70 are improperly rejected under 35 U.S.C. §103(a) as being unpatentable over Armstrong (U.S. Patent No. 4,381,546, hereinafter “Armstrong”).

Regarding claims 14, 62, and 70, the Examiner’ Answer states:

“Applicant traverses the rejection of claims 14, 62 and 70, arguing that the Armstrong patent fails to describe an error calculator, a distribution chart and a data peak detector.

However, these claims were rejected under 35 USC 103 as obvious over the Armstrong patent. The claims were found to have been obvious because they merely include known statistical tools such as an error calculator, a distribution chart and a data peak detector. Although the Armstrong patent does not specifically describes these statistical tools, it was proposed that it would have been obvious to include an error calculator, a distribution chart and a data peak detector since these are well known parameters in statistical analysis. Applicant fails to present why the inclusion of an error calculator, a distribution chart and a data peak detector in the Armstrong patent would not have been obvious.”

Appellants respectfully submit that it would be obvious to those having ordinary skill in the art that that, while an error calculator, a distribution chart, or a data peak detector are known parameters in statistical analysis, the Appellants invention does not use them for

statistical analysis and that, while Armstrong uses statistical analysis, it is for the analysis of interference and not for statistical analysis of the results of the interference analysis so it would not be obvious to add the claimed elements.

Further regarding independent claim 70, it is respectfully submitted that the claim is allowable for the same reasons as claim 1.

Based on the above, it is respectfully submitted that claims 14, 62, and 70 are allowable under 35 U.S.C. §103(a) as being patentable over Armstrong because:

“[T]he prior art reference (or references when combined) must teach or suggest **all** the claim limitations. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, and not based on applicant’s disclosure.” [Bold for clarity] *In re Vaeck*, 947 F2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991)

CONCLUSION AND RELIEF REQUESTED

Claims 1, 3-14, 18, 40, 54, and 56-62 are patentable over the prior art.

Reversal of the Examiner's decisions is respectfully requested.

To the extent necessary, a petition for an extension of time under 37 C.F.R. 1.136 is hereby made. Please charge any shortage in fees due in connection with the filing of this paper, including any extension of time fees, to Deposit Account No. 50-0374 and please credit any excess fees to such deposit account.

Respectfully submitted,



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Claims on Appeal (Please refer to the Appeal Brief)